

THE SOUTH AFRICAN MUSEUM'S *MEIRING NAUDE* CRUISES

PART 3

HYDROIDA

By

N. A. H. MILLARD

South African Museum, Cape Town

(With 10 figures and 1 table)

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ABSTRACT

The paper describes a collection of hydroids from off the east coast of South Africa, most of them from depths of over 500 m. In all there are 34 species, of which 8 are new records for the country. Among the latter are 1 new genus—*Uniscyphus*—and 3 new species—*Cladocarpus natalensis*, *Uniscyphus fragilis* and *Zygophylax inconstans*.

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INTRODUCTION

The hydroids described in this paper were dredged off the coast of Natal during two cruises of the R.V. *Meiring Naude* undertaken by the Marine Biology Department of the South African Museum during May 1975 and May 1976. The Station Data for these two cruises were given in an earlier number of this journal (Louw 1977) and will not be repeated here.

The depths of the samples varied from 40 to 1 200 m; most of them were over 500 m, so that these samples were from well over the edge of the continental shelf at 200–400 m, an area which is poorly known and where little collecting has been done.

LIST OF SPECIES

* New records for South Africa

† Discussed further in the following pages

	Station number	South African Museum number
Family Bougainvilliidae		
*† <i>Garveia crassa</i> (Stechow, 1923)	SM 58	SAM-H2875
	SM 66	SAM-H2876
Family Campanulinidae		
*† <i>Egmundella ?superba</i> Stechow, 1921	SM 38	SAM-H1967
<i>Modeeria rotunda</i> (Quoy & Gaimard, 1827)	SM 23	SAM-H1963
	SM 86	SAM-H2808
† <i>Opercularella</i> sp.	SM 38	SAM-H1969
	SM 103	SAM-H2854
*† <i>Stegolaria geniculata</i> (Allman, 1888)	SM 38	SAM-H1968
Family Haleciidae		
<i>Halecium tenellum</i> Hincks, 1861	SM 92	SAM-H2812
	SM 103	SAM-H2858
Family Lafocidae		
<i>Acryptolaria conferta</i> (Allman, 1877)	SM 15	SAM-H1952
	SM 23	—
	SM 86	SAM-H2807
	SM 94	SAM-H2847
	SM 103	SAM-H2852
	SM 107	SAM-H2856
<i>Acryptolaria rectangularis</i> (Jarvis, 1922)	SM 15	—
	SM 16	SAM-H1953
	SM 23	SAM-H1957
	SM 86	SAM-H2805
	SM 94	SAM-H2848
	SM 107	—
<i>Filellum serratum</i> (Clarke, 1879)	SM 38	SAM-H1978
	SM 43	—
† <i>Lafoea dumosa</i> (Fleming, 1820)	SM 23	SAM-H1958
	SM 38	SAM-H1965
	SM 67	SAM-H2801
	SM 86	SAM-H2871
	SM 92	SAM-H2811
	SM 99	SAM-H2849
	SM 103	SAM-H2851
<i>Zygophylax africana</i> Stechow, 1923	SM 23	SAM-H1973
	SM 86	SAM-H2806
	SM 92	—
*† <i>Zygophylax brownei</i> Billard, 1924	SM 23	SAM-H1974
	SM 86	SAM-H2874
*† <i>Zygophylax inconstans</i> sp. nov.	SM 23	SAM-H1975
	SM 43	SAM-H1977
<i>Zygophylax sibogae</i> Billard, 1918	SM 23	SAM-H1956
	SM 31	SAM-H1964
	SM 52	SAM-H2800
	SM 86	SAM-H2804
	SM 92	SAM-H2846

	Station number	South African Museum number
Family Campanulariidae		
<i>Campanularia hincksii</i> Alder, 1856	SM 23	SAM-H1961
<i>Clytia gravieri</i> (Billard, 1904)	SM 20	SAM-H2859
	SM 79	SAM-H2913
	SM 80	—
	SM 95	SAM-H2926
<i>Clytia paulensis</i> (Vanhöffen, 1910)	SM 16	SAM-H1954
Family Sertulariidae		
<i>Sertularella leiocarpa</i> (Allman, 1888)	SM 15	SAM-H1951
	SM 38	SAM-H1979
	SM 86	SAM-H2809
	SM 103	—
*† <i>Symplectoscyphus amphoriferus</i> (Allman, 1877)	SM 38	SAM-H1981
	SM 86	SAM-H2810
<i>Symplectoscyphus arboriformis</i> (Markt.-Turn., 1890)	SM 43	SAM-H1980
<i>Symplectoscyphus paulensis</i> Stechow, 1923	SM 100	SAM-H2850
	SM 107	SAM-H2855
*† <i>Uniscyphus fragilis</i> g. nov., sp. nov.	SM 43	SAM-H1982
Family Plumulariidae		
† <i>Antennella quadriaurita</i> Ritchie, 1909	SM 23	SAM-H1962
	SM 38	SAM-H1983
	SM 43	SAM-H1966
	SM 52	SAM-H2877
	SM 83	SAM-H2878
	SM 86	SAM-H2879
	SM 103	SAM-H2880
<i>Cladocarpus distomus</i> Clarke, 1907	SM 67	SAM-H2866
	SM 86	SAM-H2865
	SM 94	SAM-H2864
† <i>Cladocarpus dofleini</i> (Stechow, 1911)	SM 86	SAM-H2860
<i>Cladocarpus millardae</i> Vervoort, 1966	SM 86	SAM-H2803
*† <i>Cladocarpus natalensis</i> sp. nov.	SM 23	SAM-H1972
	SM 86	SAM-H2861
† <i>Cladocarpus sinuosus</i> Vervoort, 1966	SM 23	SAM-H1970
	SM 86	SAM-H2863
	SM 103	SAM-H2862
<i>Halopteris glutinosa</i> (Lamouroux, 1816)	SM 86	SAM-H2869
<i>Halopteris polymorpha</i> (Billard, 1913)	SM 23	SAM-H1959
	SM 86	SAM-H2870
<i>Kirchenpaueria triangulata</i> (Totton, 1930)	SM 52	SAM-H2799
	SM 71	SAM-H2802
	SM 86	SAM-H2863
<i>Nemertesia ramosa</i> Lamouroux, 1816.	SM 23	SAM-H1960
	SM 103	SAM-H2853
<i>Plumularia mossambica</i> Millard, 1975.	SM 86	SAM-H2867
<i>Thecocarpus flexuosus flexuosus</i> (Lamouroux, 1816)	SM 115	SAM-H2857

SYSTEMATIC ACCOUNT

Family **Bougainvilliidae***Garveia crassa* (Stechow, 1923)

Fig. 1A-C

Bimeria crassa Stechow, 1923b: 103. Stechow, 1925: 414, fig. 4.

Description

Colonies growing luxuriantly over the tubes of the polychaet worm, *Loimia* sp., and almost completely obscuring them. Stem strongly fascicled and about 1 mm thick at base, branching freely and quite irregularly, with many of the larger branches reuniting to form a complex meshwork, reaching a maximum height of 40 mm. The thicker parts of the stem commonly containing large spaces between the bundles of tubes, these spaces packed with mud and Foraminifera. Terminal branches unfascicled or lightly fascicled, bearing hydranth pedicels which are usually narrowest at origin and wider distally. Perisarc roughly corrugated and folded throughout, continued over the bases of the hydrothecae to form pseudohydrothecae, but leaving the tentacles free. Hydranth with about nine tentacles.

Gonophores shortly stalked, borne rather sparsely on stem and hydranth pedicels, oval, covered with a thin envelope of perisarc, the largest 0,33 mm long and 0,17 mm wide, in the form of fixed sporosacs, though not mature enough to determine sex.

Nematocysts of at least two kinds:

- (i) Desmonemes; $3,6 \times 2,4 - 4,2 \times 3,2 \mu\text{m}$.
- (ii) Microbasic euryteles; $5,4 \times 2,7 - 6,0 \times 3,3 \mu\text{m}$.

Remarks

This species was described by Stechow from 741 m off the coast of Somaliland. It is a new record for South Africa, where it occurs in roughly the same depth (720–850 m). Stechow did not mention the substratum and he presumably had only a detached stem available to him. It would be interesting to know whether the species always occurs on polychaet tubes.

In accordance with modern practice the genus *Bimeria* is restricted to those species where the bases of the tentacles are clothed with tubes of perisarc. This species must thus be transferred to the genus *Garveia* Wright, 1859, in which the pseudohydrotheca terminates below the tentacle bases.

Family **Campanulinidae***Egmundella ?superba* Stechow, 1921

Fig. 1D-G

Egmundella superba Stechow, 1921: 226. Stechow, 1923a: 126, fig. R. Vervoort, 1966: 110, fig. 10.

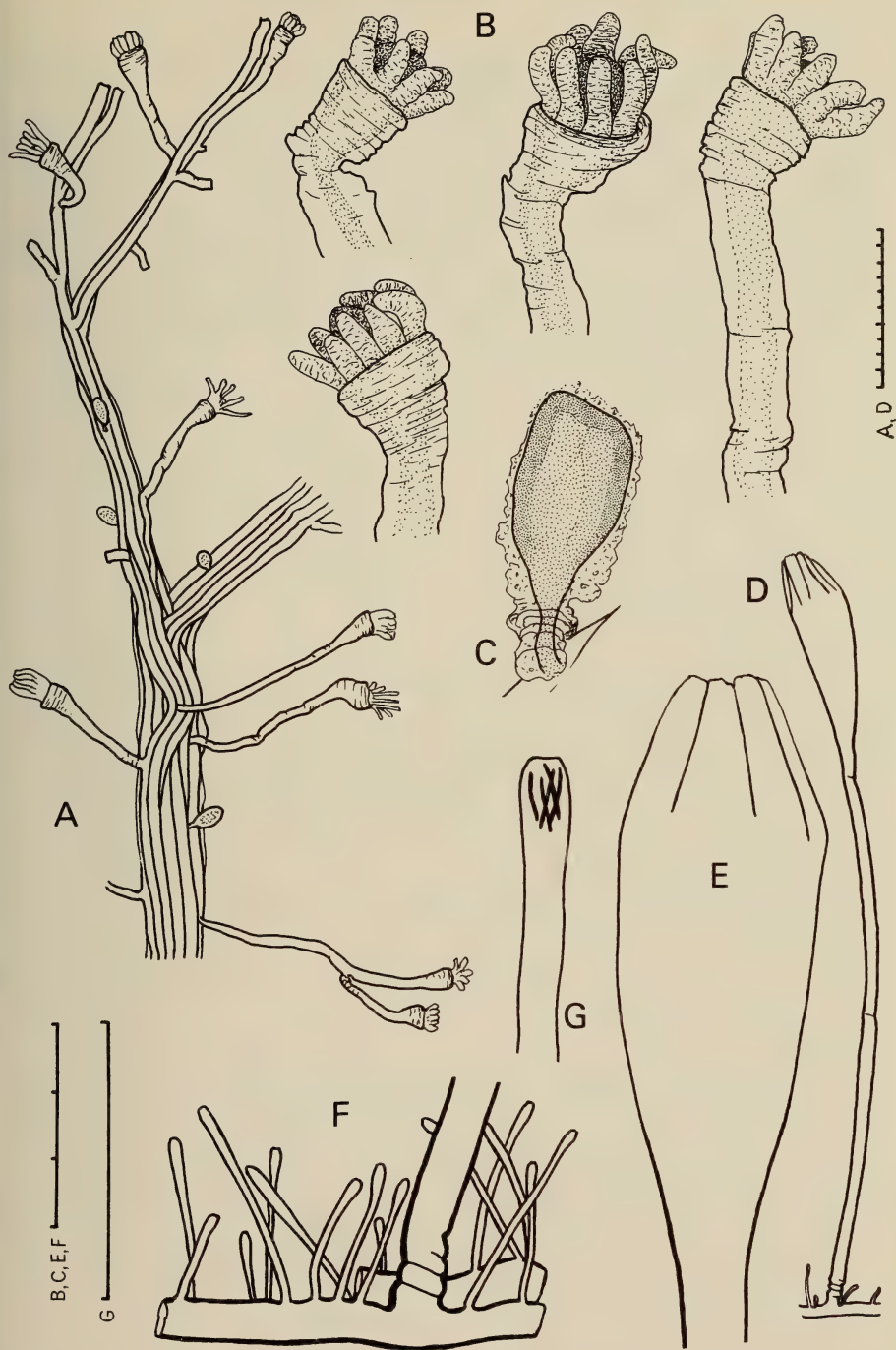


Fig. 1. *Garveia crassa* (Stechow). A. Part of a fascicled stem bearing hydranths. B. Four hydranths. C. Gonophore.
Egmondella ?superba Stechow. D. Hydrotheca and pedicel. E. Hydrotheca. F. Hydrorhiza with nematophores and origin of pedicel. G. Nematophore.

Scale in mm/10.

Description

A colony of seven solitary hydrothecae and many sterile pedicels arising from a hydrorhiza creeping on sponge spicules.

Pedicel long, with two to four distinct annulations close to base, otherwise smooth except for occasional regeneration nodes. Hydrotheca not distinctly demarcated from pedicel, top-shaped and widest at margin, depth two and a half to three and a third times maximum diameter, without diaphragm or annular thickening. Operculum deep, with about eight irregularly folded valves, which are not demarcated from thecal margin. Hydranths completely absent.

Nematothecae abundant, arising from hydrorhiza, of irregular length, tubular but slightly swollen at distal end.

Measurements (mm)

Total length	. . . . .	3,21-6,20
Pedicel, diameter	. . . . .	0,08-0,09
Hydrotheca, approximate depth	. . . . .	0,80-1,20
maximum diameter	. . . . .	0,32-0,38
Nematotheca, length	. . . . .	0,05-0,42
maximum diameter	. . . . .	0,02

Remarks

Of all the known species of *Egmundella* this material most closely resembles *E. superba*. The hydrotheca is slightly broader than that of the holotype (redescribed by Vervoort 1966), but is otherwise similar, and the pedicel is similarly annulated at the base only. The nematothecae differ in their variable length and in their profuse growth which may completely cover the hydrorhiza like a bristly mat.

The type locality and only previous record of *E. superba* is St Thomas, West Indies (depth not given). It is a new record from South Africa.

Opercularella sp.

Fig. 2

Description

Several branched stems reaching 22 mm in height and growing on sponge spicules. Stem branching sympodially, fascicled, giving off alternate hydrothecae from an axial tube, straight or very slightly geniculate, the two rows of hydrothecae in one plane. Branches rather irregular, occasionally subalternate and arising below every third and fourth hydrotheca, similar to stem but unfascicled or lightly fascicled only, the two rows more or less in one plane. Stem and branches either unsegmented or with a faint and very oblique node immediately above the origin of each hydrotheca. Some solitary hydrothecae arising separately from hydrorhiza.

Hydrotheca pedicellate. Pedicel shorter than hydrotheca and not clearly demarcated from it (boundary only recognizable by attachment of hydranth base

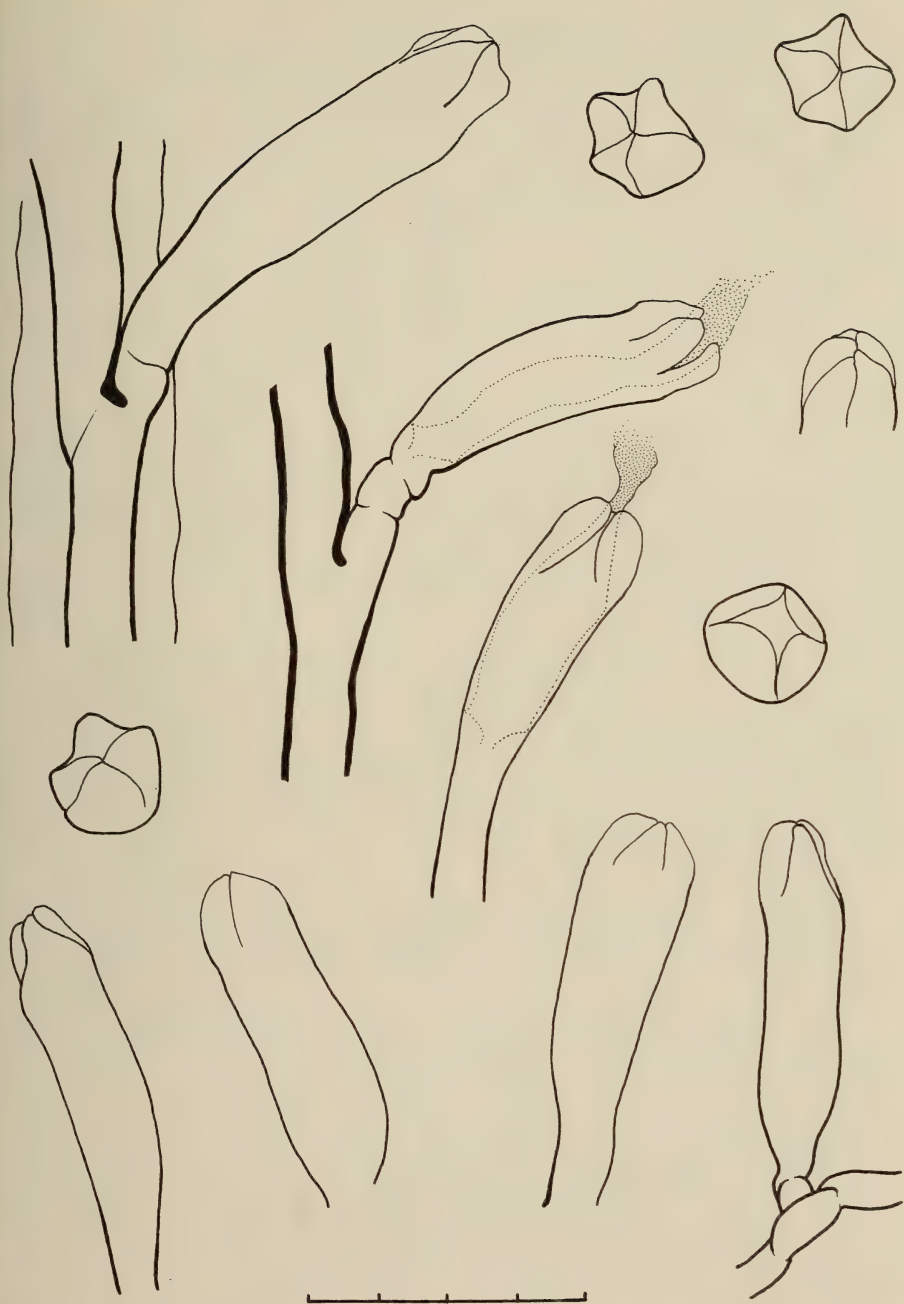


Fig. 2. *Opercularella* sp. Various hydrothecae and opercula, a solitary hydrotheca at bottom right. Scale in mm/10.

to hydrotheca), forming a very acute angle with stem and often pressed against it at base, sometimes with one or two indistinct corrugations. Hydrotheca tubular, asymmetrical and curved away from stem, with adcauline wall more convex than abcauline. Solitary hydrothecae less curved. No diaphragm visible. Operculum of four or five fragile converging segments which are not sharply demarcated from thecal margin.

Gonothecae absent.

Measurements (mm)

Pedicel, length	0,07-0,26
Hydrotheca, length abcauline	0,35-0,54
maximum diameter	0,11-0,16

Remarks

This material is unlike any other described species. It is perhaps closest to '?*Opercularella* spec. no. 2' of Vervoort (1966: 108), but differs from it in the curved hydrothecae and the smaller number of opercular segments. The operculum is very delicate and crumples easily; it can only be seen clearly by slicing off the top of the hydrotheca and viewing from above. Since the material is not very well preserved and is infertile the writer prefers not to describe it as a new species.

Stegolaria geniculata (Allman, 1888)

Fig. 3

Cryptolaria geniculata Allman, 1888: 41, pl. 20 (figs 1, 1a, 1b).

?*Cryptolaria operculata* Nutting, 1905: 947, pl. 3 (fig. 4), pl. 10 (figs 12-14). Ritchie, 1910: 9.

Stegopoma operculatum: Billard, 1941: 16, fig. 1.

Stegolaria geniculata: Vervoort, 1946: 299, figs 2-3. Edwards, 1973: 593.

Stegolaria operculata: Edwards, 1973: 594.

Description

Several branching fan-shaped stems reaching a maximum height of 40 mm and several smaller ones, growing on a gorgonian skeleton, sponge spicules and a worm tube.

Stem strongly fascicled, giving rise to alternate hydrothecae and roughly alternate or subalternate branches from an axial tube. Branches similar to stem, fascicled almost to the end. The two rows of branches and hydrothecae in one plane.

Hydrotheca tubular, curved smoothly outwards, adnate to stem or branch for half to two-thirds height and in the thicker parts of the stem with the adnate part immersed among the peripheral tubes. Axillary hydrotheca with abcauline wall adnate to branch. Base of hydrotheca without diaphragm or perisarcial thickening, but usually demarcated by an indentation of the abcauline wall. Distal part of hydrotheca very delicate and usually damaged. Operculum of the *Stegopoma* type, consisting of two pleated valves seated in the embayments between two gable-like processes of the margin.

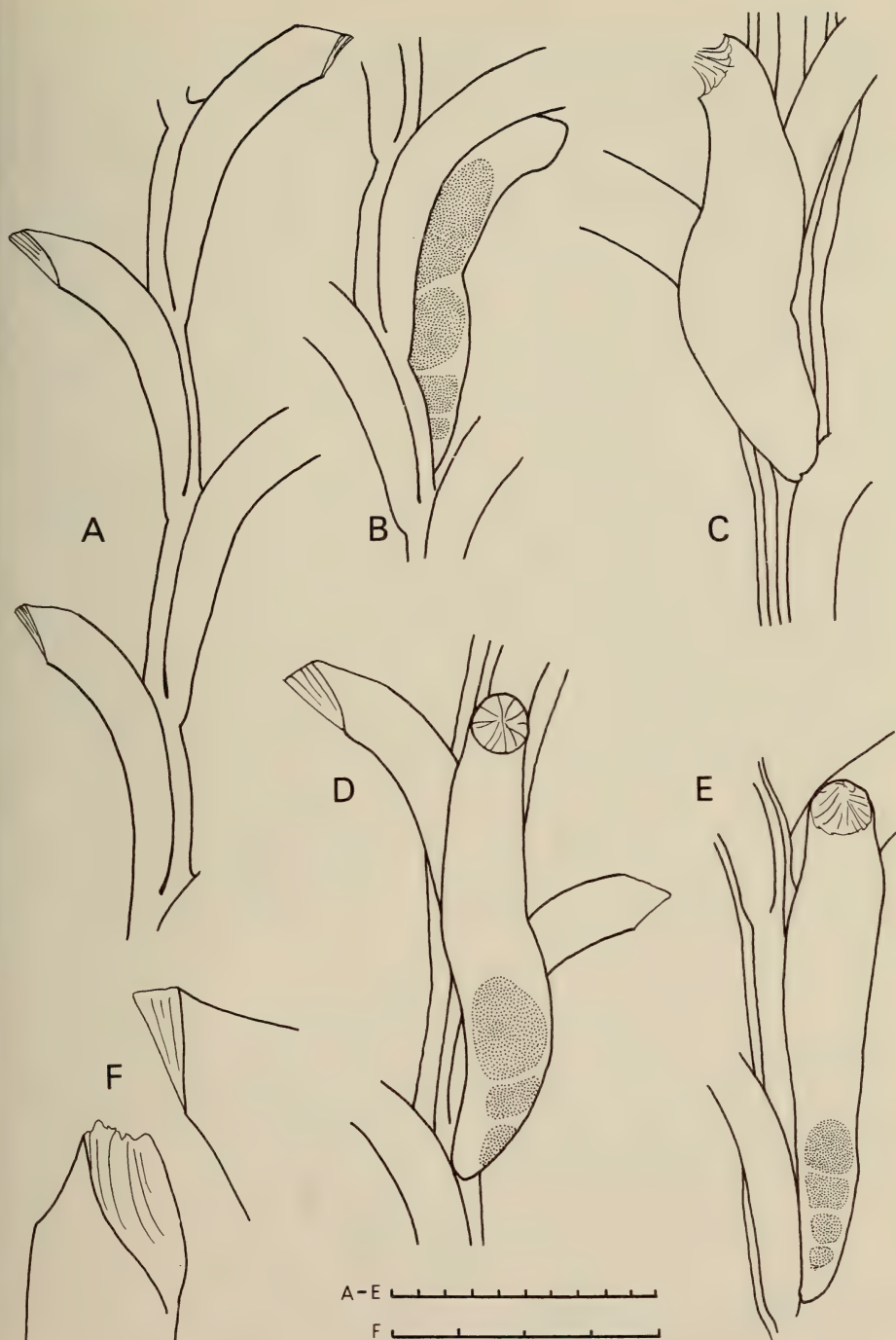


Fig. 3. *Stegolaria geniculata* (Allman). A. Part of stem from distal end. B-E. Parts of stem with gonothecae. F. Distal ends of two hydrothecae to show opercula. Scale in mm/10.

Gonotheca sac-shaped, completely adnate to branch. Aperture facing away from branch and sometimes raised slightly above it, subterminal, circular, with an operculum of fragile converging segments. Containing up to five gonophores (probably male) one above the other.

Measurements (mm)

Hydrotheca, length abcauline (approx.)	0,96-1,62
length adcauline, adnate part	0,72-0,96
length adcauline, free part	0,36-0,93
diameter at mouth	0,19-0,40
Gonotheca, length	1,11-2,02
maximum diameter	0,26-0,46
diameter of aperture	0,17-0,23

Remarks

The author can see little to distinguish *Stegolaria operculata* from *S. geniculata* other than the markedly geniculate stem of the latter. In the present material the degree of geniculation is variable and in general intermediate between the two, the tips of some branches being almost as geniculate as those illustrated by Allman and Vervoort for *S. geniculata* and other branches being completely straight as in *S. operculata*. She has therefore united the two species. The gonothecae are exactly like those described by Vervoort (1946).

The genus *Stegolaria* has been retained in view of the peculiar gonothecae; since these contain fixed sporosacs the genus cannot be united with *Modeeria*. The status of *Stegopoma* awaits further information on reproduction.

Distribution

Fiji (type locality), Hawaii, East Indies (Celebes and Kei Island), Malay Archipelago. A deep-water species ranging from 253 to 910 m. A new record from South Africa.

Family **Lafocidae**

Lafoea dumosa (Fleming, 1820)

Remarks

The opinion of Cornelius (1975) is accepted that *Lafoea fruticosa* (M. Sars) is a synonym for *L. dumosa* (Fleming). This cosmopolitan species is well known from deeper waters of the South African coast.

Zygophylax brownei Billard, 1924

Fig. 4

Lafoea pinnata: Browne, 1907: 25.

Zygophylax pinnata: Billard, 1923: 14, fig. 1A.

Zygophylax brownei Billard, 1924: 64. Leloup, 1940: 11, pl. 1 (fig. 7). Patrìti, 1970: 28, fig. 30.

Description

Two colonies with stems reaching a maximum height of 61 mm, stiff, fascicled, bearing alternate hydrothecae and subalternate branches in one plane. Branches usually arising immediately below every third and fourth hydrotheca, bearing alternate hydrothecae, sometimes rebranching in a similar manner to the stem. Where the branching follows this regular subalternate scheme, both hydrothecae and branches arise from a single axial tube, but this arrangement is sometimes obscured by extra branches and hydrothecae from peripheral tubes. These possibly represent auto-epizootic colonies but it is no longer possible to distinguish the hydrorhizae.

Hydrotheca and pedicel together forming a bilaterally symmetrical tubular figure which is more convex on the adcauline side. Pedicel with no node separating it from the apophysis but demarcated by an indentation on adcauline side, separated internally from hydrotheca by a well-developed diaphragm. Hydrotheca everted at margin.

Nematothecae scarce, occurring singly on stem apophyses, usually only one or two to a stem; tubular, with everted margin, variable in length.

Gonothecae (present in Station SM 23) quite separate from one another, not conjoined in a coppinia but clustered thickly round certain parts of the stem; deep-oval, not compressed, with two apertures (rarely three), each on the end of a recurved tubular neck; containing planula larvae; with no special accumulations of nematothecae.

*Measurements (mm)**Station SM 23 Station SM 86*

Pedicel, length adcauline	0,06-0,10	0,05-0,12
Hydrotheca, length adcauline	0,34-0,41	0,31-0,47
diameter at margin	0,16-0,19	0,14-0,18
Gonotheca, length	0,08-1,32	—
maximum diameter (below necks) . .	0,31-0,38	

Remarks

Z. brownei is closely related to *Z. biarmata* Billard, 1905, and is in fact included with it by Broch (1918). It is, however, retained as a separate species by Leloup (1940) on the basis of the sparser distribution of nematothecae. This is the first record of *Z. brownei* from the southern hemisphere and the first description of gonothecae; the latter are similar in general shape to those of *Z. biarmata* (as described by Saemundsson (1912) under the name of *Lictorella levinseni*) but are proportionally longer and more slender, and are without the numerous nematothecae described by Broch (1918).

Both these species have a north Atlantic distribution. Records of *Z. biarmata* from other parts of the world (Jäderholm 1919, from Japan; Jarvis 1922, from east Africa) were all sterile and thus still need confirmation.

Distribution

Eastern North Atlantic from France to Morocco, 20–752 m. Type locality: Bay of Biscay. A new record from South Africa.

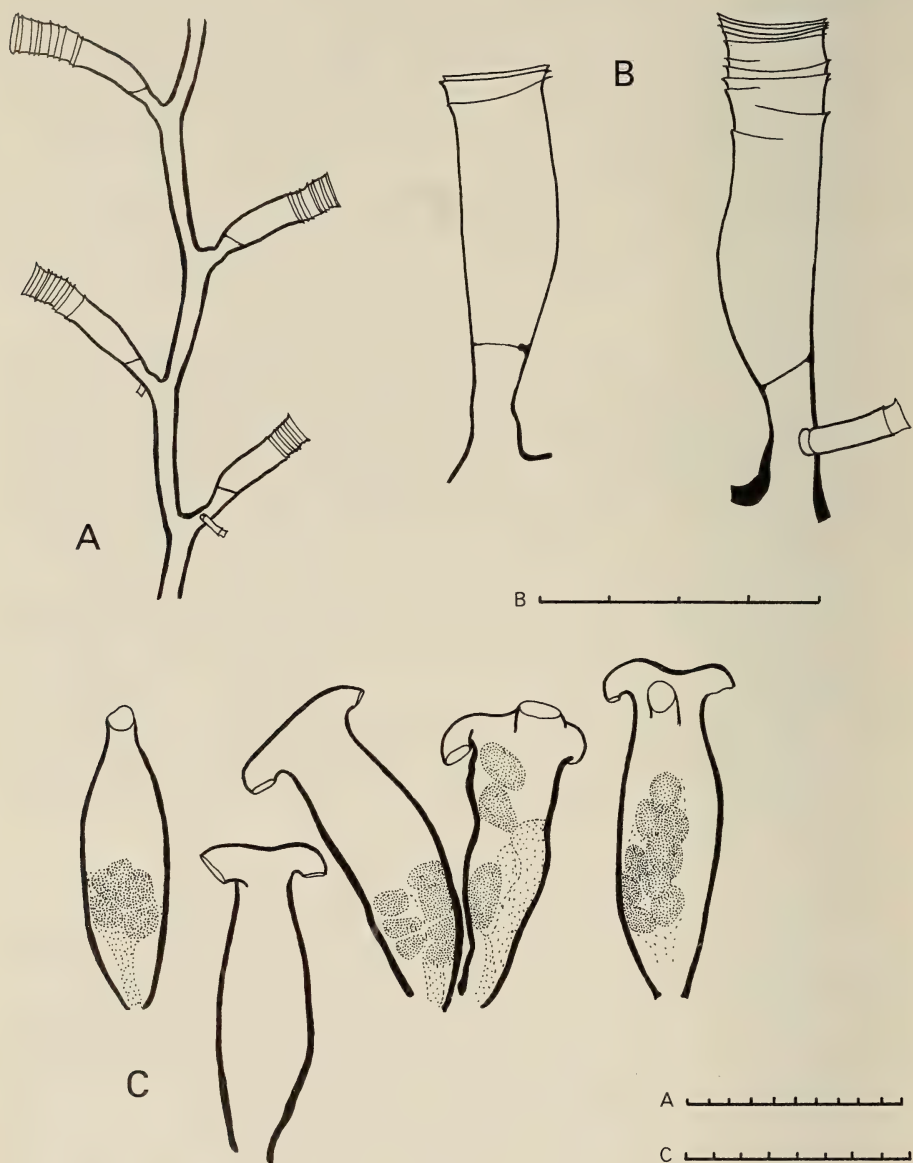


Fig. 4. *Zygophylax brownei* Billard. A. Part of stem. B. Hydrothecae. C. Gonothecae, that on extreme left in side view, the two on extreme right each with three openings. Scale in mm/10.

Zygophylax inconstans sp. nov.

Fig. 5

Material

Holotype: SAM-H1975. Station SM 23: 27°44,4'S 32°42,8'E, 400-450 m.

Other material: SAM-H1977. Station SM 43: 28°45,5'S 32°24,5'E, 360-420 m.

Description of holotype

Colony growing on a polyzoan and consisting of slender, straggling stems often reattaching to one another and to the polyzoan and producing a tangled irregular growth one or two centimetres in height. Stem unfascicled or lightly fascicled, unbranched or branching irregularly and in any plane, unsegmented, geniculate, bearing alternate hydrothecae on short apophyses which arise at the 'elbows'. Peripheral tubes arising at origins of branches.

Hydrotheca and pedicel not sharply demarcated externally, together forming a deep-campanulate figure which may be radially symmetrical or slightly bilaterally symmetrical with the adcauline surface more convex than the abcauline. Margin of hydrotheca everted. Diaphragm distinct, usually oblique.

Nematothecae numerous, one to three on each apophysis (usually two), and scattered on peripheral tubes of stem and on hydrorhiza; tubular, two-chambered, with short basal chamber and long distal chamber, with everted margin.

Coppinae present surrounding thicker parts of stem, consisting of a mass of conjoined gonothecae, but without modified hydrothecae or nematothecae. Gonotheca saccular and of irregular shape, with a single aperture with a flared margin on the summit of a short tubular neck.

Measurements (mm)

Pedicel, length adcauline	.	.	.	0,03-0,06
Hydrotheca, length adcauline	.	.	.	0,22-0,30
diameter at margin	.	.	.	0,10-0,12
Gonotheca, length	.	reaching	.	0,72
maximum diameter	.	reaching	.	0,52

Remarks

The ramifications of these colonies are so intimately associated with the polyzoan that it is almost impossible to separate the two. The hydrorhiza runs along the upright stem of the host, separating from it and attaching to other parts at intervals; it produces erect stems, solitary hydrothecae and numerous nematothecae.

There are two species of *Zygophylax* which share certain characters with this material, namely a closed coppinia, a gonotheca with a single terminal aperture, small deep-campanulate hydrothecae, and two nematothecae to each hydrotheca-bearing apophysis. These are *Z. armata* (Ritchie, 1907) and *Z. profunda* Quelch,

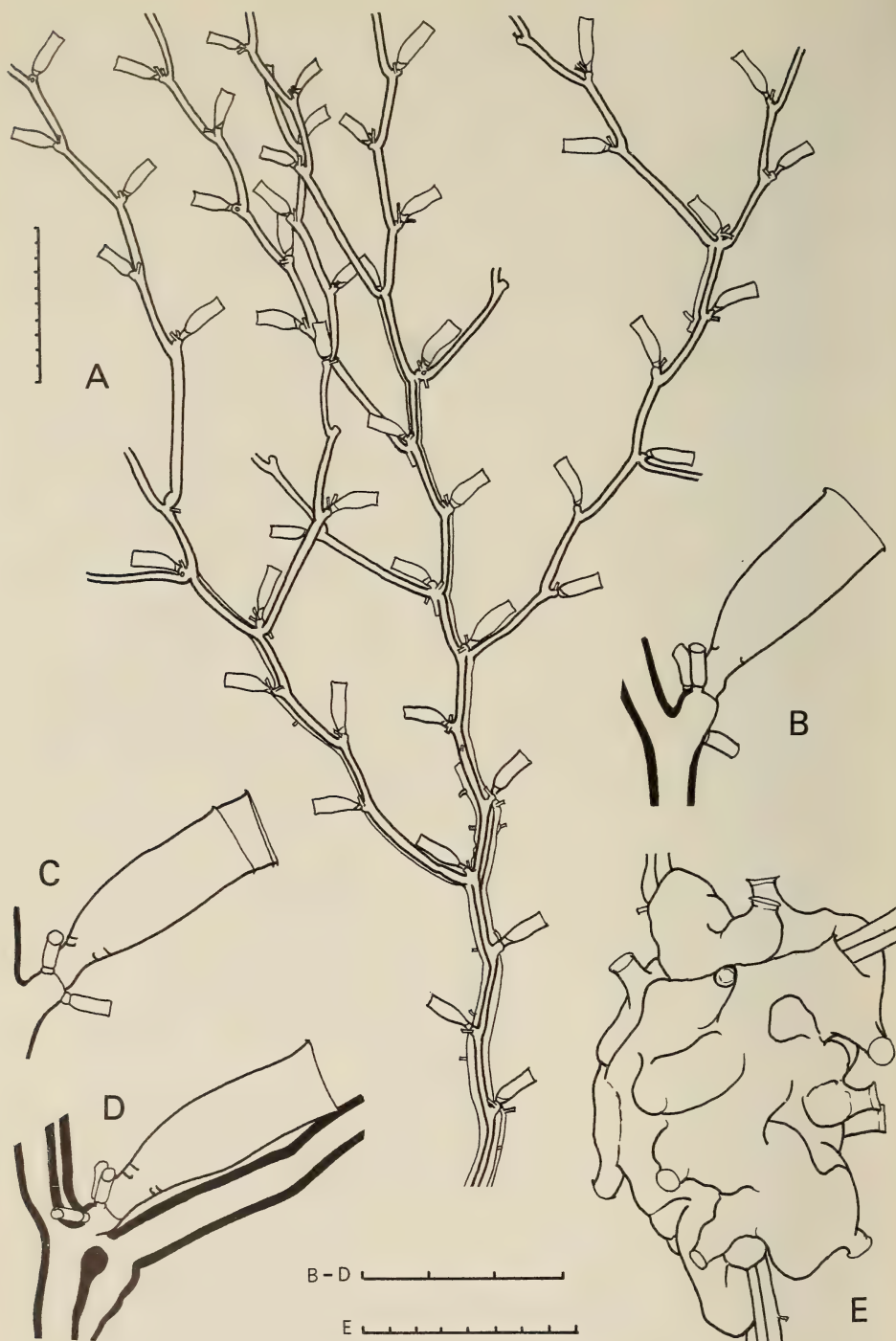


Fig. 5. *Zygophylax inconstans* sp. nov. from the holotype, SAM-H1975. A. Part of stem. B-C. Hydrothecae. D. Axillary hydrotheca, and origin of peripheral tubes. E. Coppinia. Scale in mm/10.

1885. Both of these have a much stiffer colony and a more heavily fascicled stem, and in both the coppinia is provided with numerous long branching nematothecae. In *Z. armata* the gonothecae are more regular and hexagonal in section. The schizoholotype of *Z. profunda* from Cape Verde is a mounted slide (B.M. no. 85.7.21.1) of infertile fragments in very poor condition. The hydrothecae are shorter and more strongly curved than in the present material (Fig. 6A). The fertile material from Madeira assigned to *Z. profunda* by Totton (1930) (slide B.M. no. 19.8.15.2) has hydrothecae more similar in shape to the present material though very slightly smaller (Fig. 6B-C). The coppinia is identical apart from the presence of branching nematothecae. It is mainly this last character that thus separates *Z. profunda* from *Z. inconstans*.

Family Sertulariidae

Symplectoscyphus amphoriferus (Allman, 1877)

Fig. 7A-D

Sertularella amphorifera Allman, 1877: 22, pl. 15 (figs 8-10). Nutting, 1904: 88, pl. 20 (figs 1-2). Billard, 1906: 183.

Symplectoscyphus ?amphoriferus: Millard, 1967: 182, fig. 4E-F.

Description

Several unfascicled stems reaching a maximum height of 21 mm, some of them branching alternately. Stem and branches geniculate in distal parts. Branches given off at a wide angle (over 80°) and with a dichotomous effect due to a more strongly marked geniculation at the origin of each branch. Nodes indistinct.

Hydrotheca deep and slender, adnate for about one-third adcauline length, curved outwards, adcauline free part straight or slightly concave. Margin with three teeth, one adcauline and two latero-abcauline. No internal teeth.

One gonotheca present, pear-shaped, with eleven raised transverse ridges and a slender terminal neck.

Measurements (mm)

Internode length	0,60-0,98
Hydrotheca, length abcauline	0,36-0,43
length adcauline, adnate part	0,20-0,23
length adcauline, free part	0,33-0,40
diameter at margin	0,12-0,14
Gonotheca, length	1,22
maximum diameter	0,74

Remarks

This material is very similar to that recorded from the southern Indian Ocean (Millard 1967). The presence of pseudodichotomous branches and a larger pro-

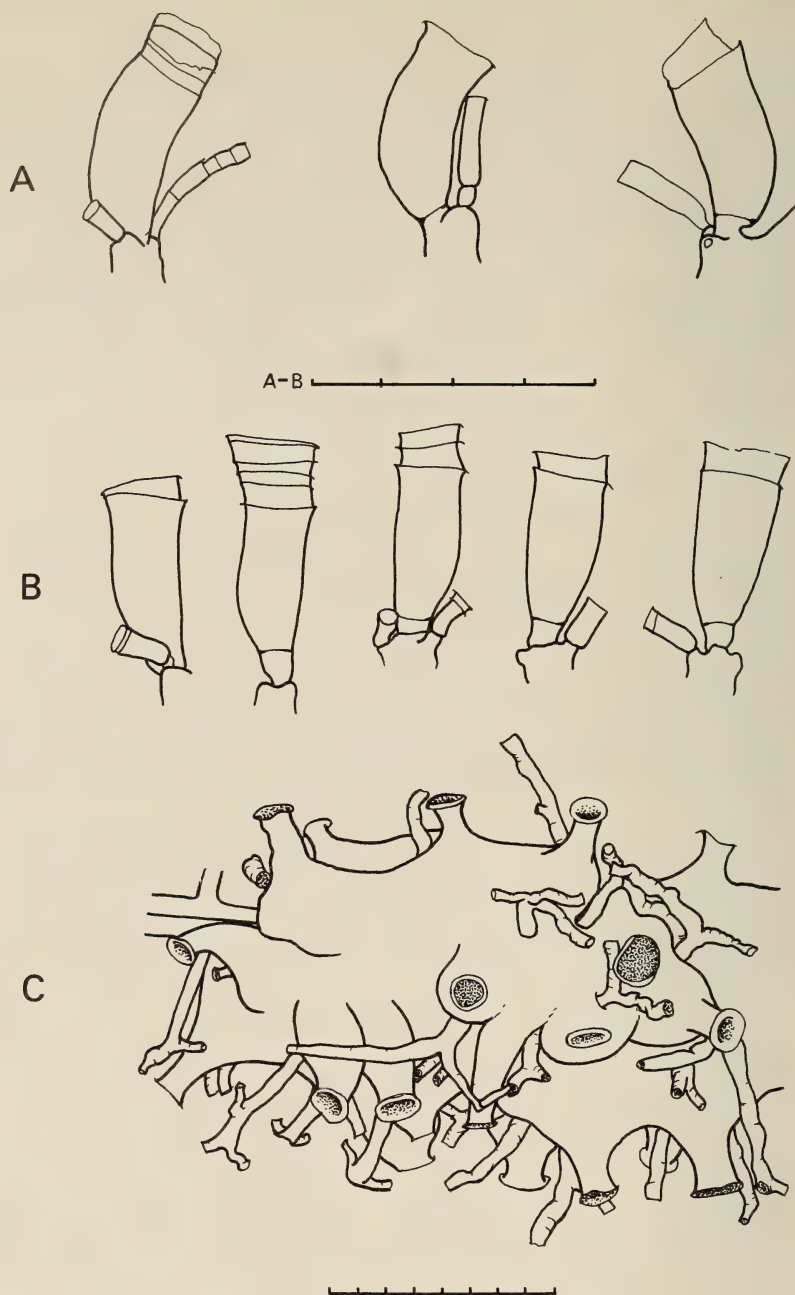


Fig. 6. *Zygophylax profunda* Quelch. A. Hydrothecae from the schizoholotype, BM 85.7.21.1. B. Hydrothecae, and C, coppinia, from Totton's material, BM 19.8.15.2. Scale in mm/10.

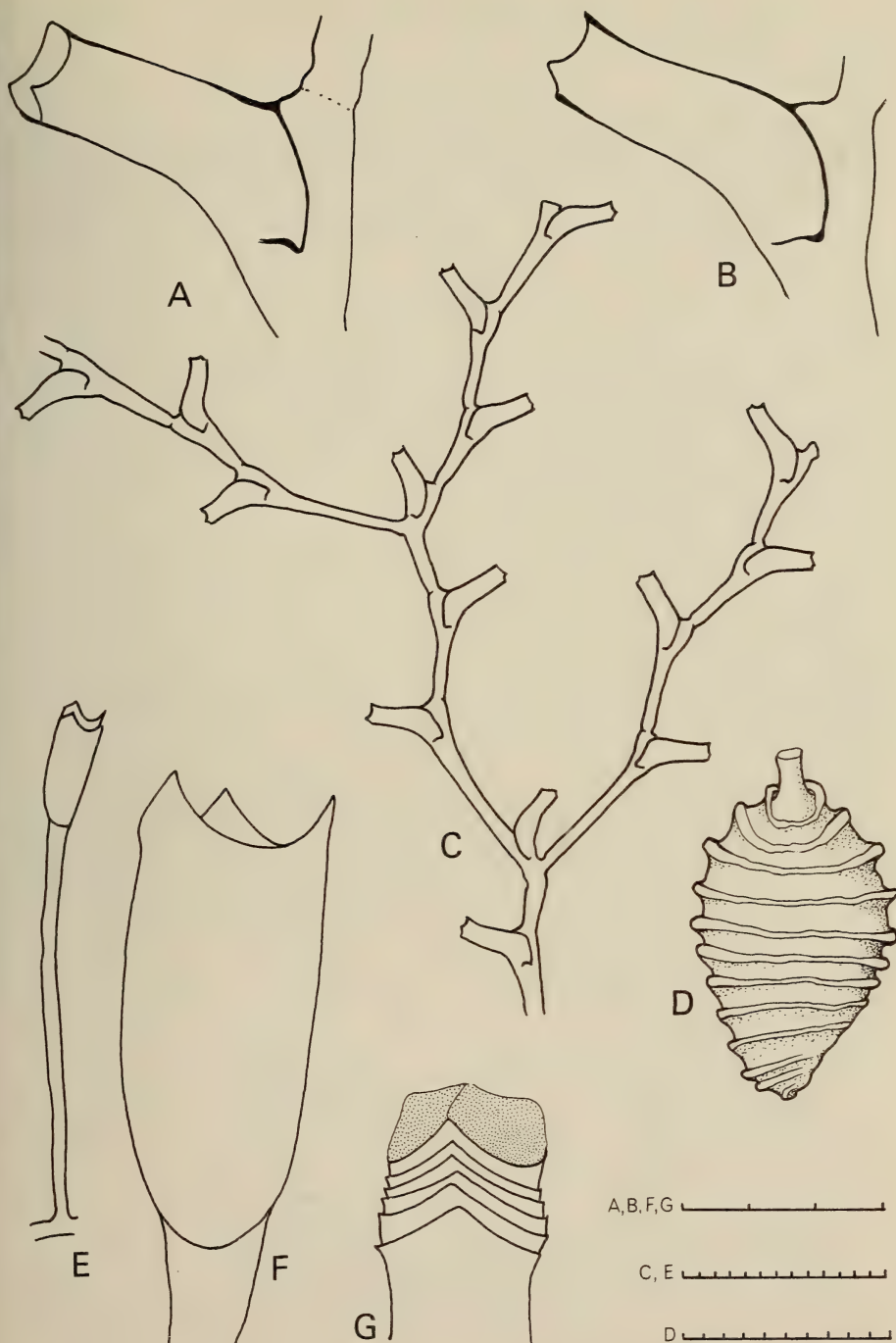


Fig. 7. *Symplectoscyphus amphoriferus* (Allman). A-B. Hydrothecae. C. Part of stem. D. Gonotheca.

Uniscyphus fragilis sp. nov. from the holotype, SAM-H1982. E. Hydrotheca and pedicel. F. Hydrotheca. G. Distal end of hydrotheca with regenerated margins and operculum.

Scale in mm/10.

portion of the hydrotheca adnate to the stem is closer to the type material and supports the identification.

Distribution

Except for one record from the southern Indian Ocean, this species is known only from the northern Atlantic from the West Indies to south-east of Iceland. All the records are from deep water and range from 185 to 1 256 m. Type locality: Double-headed Shot Key. A new record from South Africa.

Uniscyphus gen. nov.

Diagnosis

Colony stolonial, with pedicellate hydrothecae arising direct from a creeping hydrorhiza. Hydrotheca cylindrical, with three marginal teeth and an operculum of three valves seated in the bays between the teeth and meeting in the centre as a pyramid.

Type species: *Uniscyphus fragilis* sp. nov.

Uniscyphus fragilis sp. nov.

Fig. 7E-G

Material

Holotype: SAM-H1982. Station SM 43: 28°45,5'S 32°24,5'E, 360-420 m. Five hydrothecae, three mounted on a slide.

Description

Hydrorhiza creeping. Hydrotheca solitary, pedicellate. Pedicel long, at least three times length of hydrotheca, slender, not annulated, arising at right angles to hydrorhiza. Hydrotheca terminal, cylindrical, not annulated, with three well-developed, equally spaced marginal teeth. No internal teeth. Operculum of three valves. Gonothecae absent.

Measurements (mm)

Pedicel length	2,4-3,9
Hydrotheca, depth to tips of teeth . . .	0,70-0,75
diameter at margin	0,25-0,29
diameter/depth	0,34-0,41

Remarks

There is no existing genus to contain this delicate species. In its stolonial form it resembles *Calamphora*, which, however, has four marginal teeth and an annulated hydrotheca. It seems to bear the same relationship to *Parascyphus* that *Calamphora* bears to *Sertularella*. The hydranths are not well preserved, and, although it is difficult to be certain, no abcauline blind pouch could be seen.

Family Plumulariidae

Antennella quadriaurita Ritchie, 1909

Fig. 8

Antennella quadriaurita Ritchie, 1909: 92, fig. 9. Leloup, 1932: 162, pl. 16 (fig. 2).

Antennella quadriaurita: Stechow, 1919: 113. Millard, 1966: 492.

Antennella quadriaurita, forma *africana* Broch, 1914: 26.

Antennella africana: Stechow, 1925: 492, fig. 11.

Antennella africana: Millard, 1975: 331, fig. 107A-E.

Discussion

The seven samples of *Antennella*, of which only the last two were fertile, have long, slender athecate internodes bearing two to four nematothecae each. This suggested an affinity with *A. quadriaurita* rather than with the South African species *A. africana* (both are species with two pairs of lateral nematothecae), and since there was already a doubt as to the separate entity of these two species a reappraisal of the South African material was undertaken. Also available for comparison was a new sample from Tristan da Cunha (SAM-H1949), and another from Nightingale Island (SAM-H1991), both collected in 1971.

It has previously been claimed (Millard 1975) that the only character separating these two species is the presence of, usually, one nematotheca on each athecate internode in *A. africana* and two or three in *A. quadriaurita*. Counts of nematothecae in the available samples (Table 1) show no geographical relationship. For example, the sample from Tristan has one nematotheca on 82 per cent of the internodes, as against Ritchie's type of *A. quadriaurita* from Gough Island, and material from the Vema Seamount (South Atlantic), where most internodes have two or three nematothecae. On the west and south coasts of South Africa most internodes have one nematotheca, yet in the sample from Port Elizabeth all internodes have two nematothecae, and in the seven samples of the present collection from Natal most have two or three.

There does, however, appear to be a relationship between the number of nematothecae and the length of the internode. This is demonstrated in Figure 8, whence it is apparent that, although there is much variation within a sample, in general longer internodes have more nematothecae. This diagram also indicates that the seven deep-water samples from Natal (Numbers 14-15, 17-21) are most closely related to the type material from Gough Island (Number 16), from which they are most distant geographically.

Within a single colony, the longer athecate internodes bearing several nematothecae tend to occur near the base of a hydrocladium and shorter ones with one nematotheca near the distal end.

From these considerations it is concluded that *A. quadriaurita* and *A. africana* cannot be retained as separate species, and the latter is sunk in the former.

The distribution of the composite species is:

Central and South Atlantic Ocean, including Havanna (Stechow 1919), the Tristan da Cunha group (Ritchie 1909, and this work), tropical west Africa

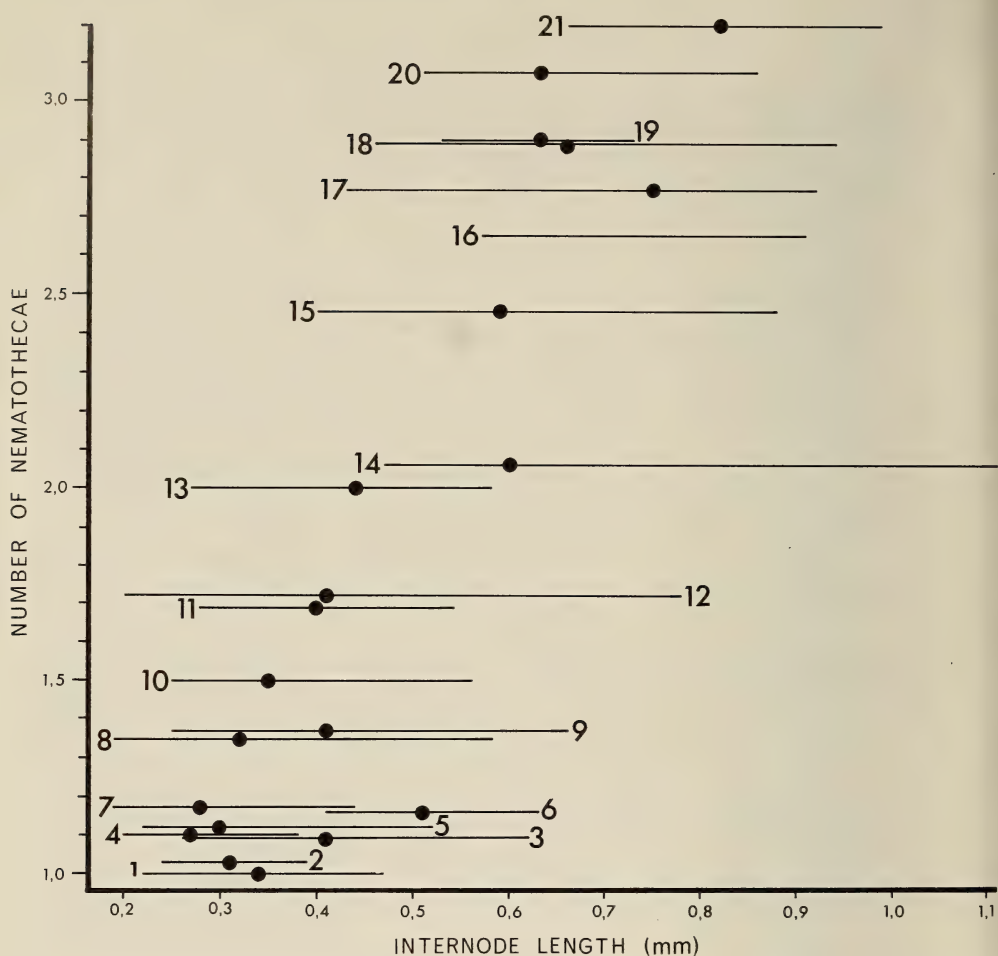


Fig. 8. The average length, with range, of the intermediate athecate internodes related to the number of nematothecae which they bear in different samples of *Antennella*.

- | | |
|-----------------------------------|--------------------------------------|
| 1. False Bay | 12. Tristan da Cunha |
| 2. Table Bay | 13. Port Elizabeth |
| 3. Agulhas Bank (34°30'S 20°56'E) | 14. Off Natal (SM 43) |
| 4. West of Cape Peninsula | 15. Off Natal (SM 23) |
| 5. Lambert's Bay | 16. Gough Island (from Ritchie 1909) |
| 6. Agulhas Bank (34°35'S 21°23'E) | 17. Off Natal (SM 86) |
| 7. Mosel Bay | 18. Off Natal (SM 83) |
| 8. Nightingale Island | 19. Off Natal (SM 103) |
| 9. Saldanha Bay | 20. Off Natal (SM 38) |
| 10. Off Lüderitz Bay | 21. Off Natal (SM 52) |
| 11. Vema Seamount | |

(Broch 1914), Vema Seamount (Millard 1966), and South Africa (Millard 1975);

Indian Ocean, including India (Leloup 1932) and South Africa (Millard 1975); Pacific Ocean, including New Zealand (Ralph 1961).

The type locality is Gough Island (Ritchie 1909).

TABLE 1

The percentage number of nematothecae per athecate internode for various samples of *Antennella*. The samples are arranged geographically, starting with the Atlantic stations and west coast, and ending with the Natal coast. The last seven samples are those from this collection.

	Number of nematothecae per internode, per cent				n	Depth (m)
	1	2	3	4		
Gough Is. (from Ritchie 1909)	—	40	55	5	20	183
Tristan	82	16	2	—	308	?
Nightingale Is.	80	20	—	—	35	?
Vema Seamount	23	74	2	—	90	42–50
Lüderitz Bay	69	30	1	—	226	35
Lambert's Bay	92	8	—	—	101	20
Saldanha Bay	74	25	1	—	118	35
Table Bay	98	2	—	—	53	9
West of Cape Peninsula	95	5	—	—	19	79
False Bay	99	1	—	—	311	0–27
Agulhas Bank: 34°30'S 20°56'E	89	11	—	—	28	73
Agulhas Bank: 34°35'S 21°23'E	80	20	—	—	30	68
Mossel Bay	63	37	—	—	38	10–20
Port Elizabeth	—	100	—	—	31	9
Natal, SM 43	2	95	3	—	113	360–420
Natal, SM 103	—	22	67	11	9	680
Natal, SM 38	—	29	64	7	14	775–825
Natal, SM 83	—	11	89	—	28	600–810
Natal, SM 86	—	23	77	—	48	550
Natal, SM 23	—	51	47	2	100	400–450
Natal, SM 52	—	—	80	20	15	720

Cladocarpus dofleini (Stechow, 1911)

Fig. 9D–F

Dinotheca dofleini: Stechow, 1925: 508, figs 49–52. Vervoort, 1966: 162, figs 63–64.

Cladocarpus dofleini: Millard, 1975: 421, fig. 130G.

Description

Two fascicled stems bearing phylactocarps, the longer 90 mm in height. Structure and dimensions very similar to those of Vervoort (1966), to which the following points may be added.

The number of cauline nematothecae between two successive hydrocladia varies from two in the distal region of the stem to six in the proximal part. The hydrocladial internodes have a shorter distal region than those illustrated by

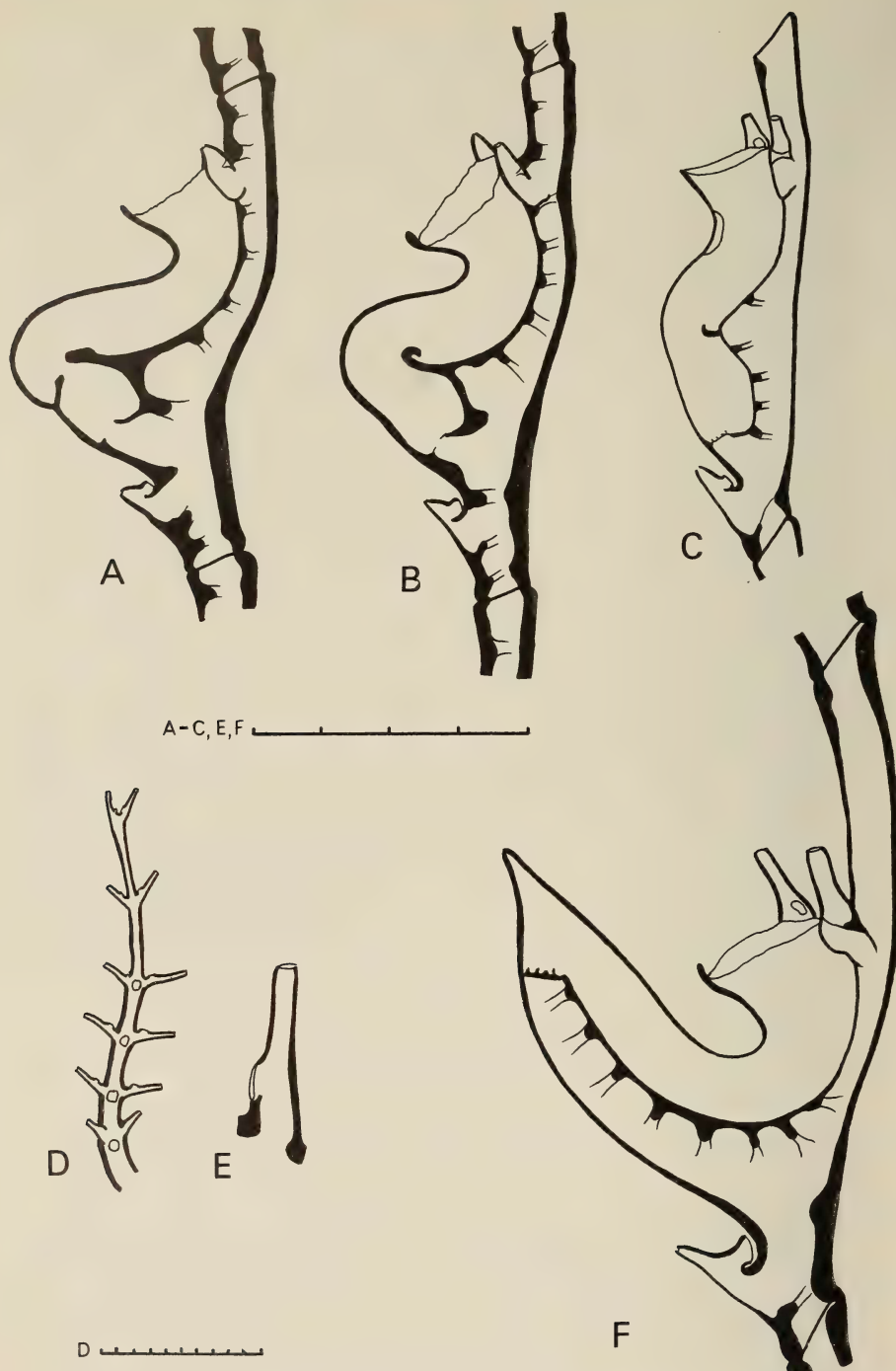


Fig. 9. *Cladocarpus sinuosus* Vervoort. A. Hydrotheca with an abcauline intrathecal septum, and B, one without. C. Hydrotheca of var. *edentatus* Vervoort. *Cladocarpus dofleini* (Stechow). D. Phylactocarp, and E, one of its nematothecae. F. Hydrotheca.

Scale in mm/10.

Stechow (1925) and are more like those of Vervoort, but the 'spine' on the hydrotheca is long, like that of Stechow. The distal end of the internode is occasionally cut off as a short athecate internode. The phylactocarps are similar to those described by Stechow, but have no gonothecae.

Measurements (mm)

Hydrocladium, internode length	0,87-0,98
Hydrotheca, distance from adcauline edge to spine	0,42-0,55
diameter at margin	0,20-0,27

Remarks

This rare species is known from the African coast from the equator to the Agulhas Bank, and occurs only in depths over 425 m.

Cladocarpus natalensis sp. nov.

Fig. 10

Material

Holotype: SAM-H2861. Station SM 86: 27°59,5'S 32°40,8'E, 550 m. Five stems, fertile.

Other material: SAM-H1972. Station SM 23: 27°44,4'S 32°42,8'E, 400-40 m. Five stems, infertile.

Description of holotype

The tallest stem 50 mm in height and bearing about seventy alternate hydrocladia. Hydrorhiza mat-like. Stem fascicled, unbranched, bearing the hydrocladia from an axial tube which is exposed on the anterior surface. Two cauline nematothecae between the origins of any two consecutive hydrocladia, of which one is axillary. Five or six septa present between two consecutive hydrocladia in the older part of the stem, but septa absent in the distal part. Segmentation obscure.

Hydrocladia 4-6 mm in length and bearing up to ten hydrothecae on anterior surface, consisting of sigmoidally curved thecate internodes separated by straight or slightly oblique nodes. Each internode with numerous septa (12-16), one hydrotheca and three nematothecae (one median inferior and one pair laterals). Distal part of internode short and terminating just above thecal margin.

Hydrotheca sigmoidally curved; abcauline wall very strongly convex immediately above base, strongly concave above this and with the maximum concavity at about half height, then widening to margin; base carried forwards with curvature and taking with it the adthecal ends of three or four internodal septa; the basal convexity capped by a hollow perisarc of variable length and direction; adcauline wall strongly curved near base, the curvature decreasing smoothly to margin. A curved adcauline intrathecal septum present in basal region and close above thecal floor. Margin with one intumed median abcauline tooth, with the rest of the edge irregularly serrated and often lower at the adcauline side, forming an angle of 50-80° with the distal end of the internode.

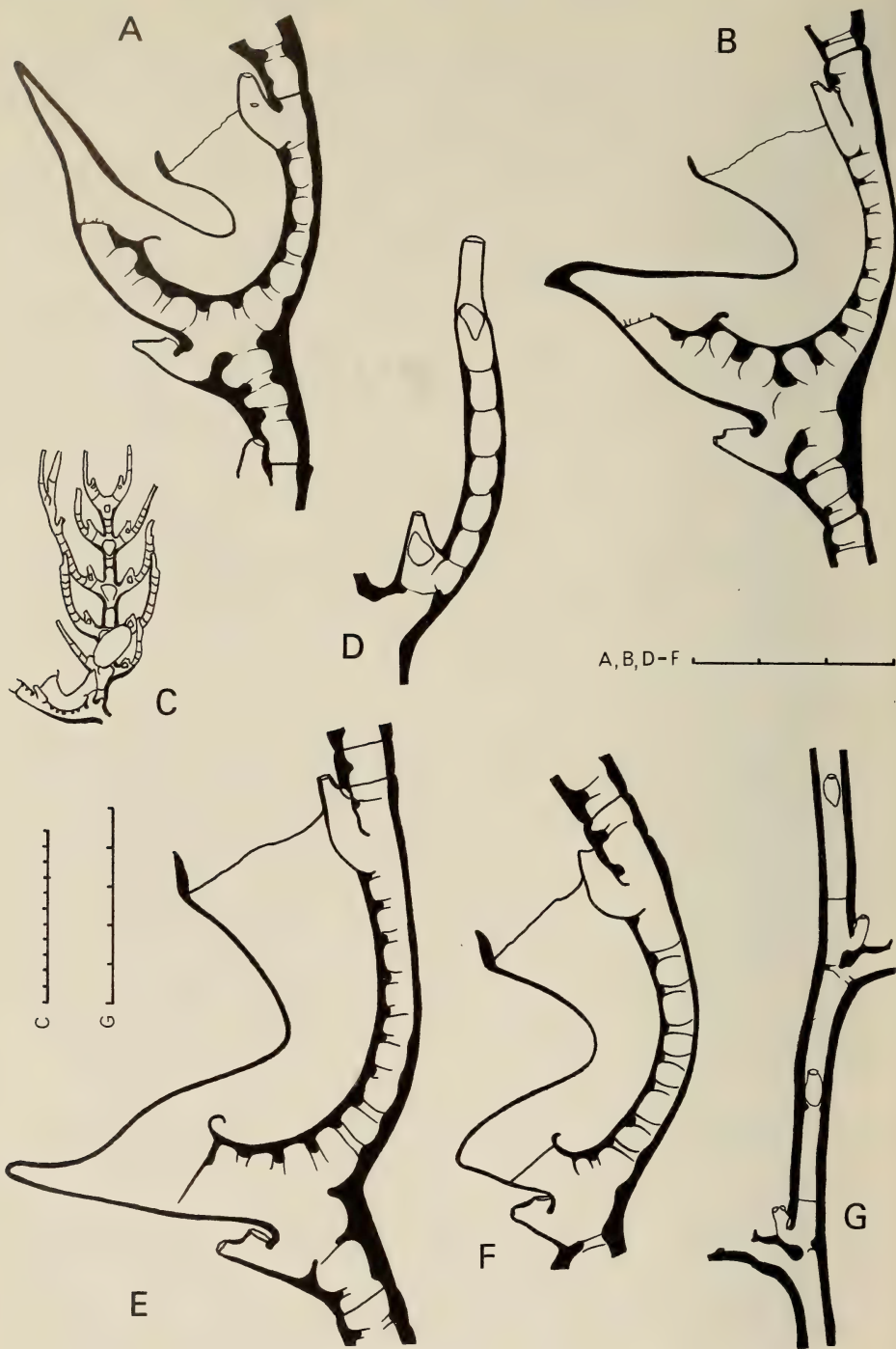


Fig. 10. *Cladocarpus natalensis* sp. nov. A-D from the holotype, SAM-H2861, and E-G from SAM-H1972. A-B. Hydrothecae. C. Phylactocarp, and D, one of its nematothecae. E-F. Hydrothecae. G. Part of stem showing cauline nematothecae and origins of two hydrocladia. Scale in mm/10.

Median inferior nematotheca free from hydrotheca and seated well below its base, with two apertures, one terminal and one on upper surface near base. Lateral nematotheca overtopping thecal margin, bifurcated, with two terminal apertures, one more elevated than the other, and one on mesial surface.

Phylactocarps borne one on first internode of hydrocladium and rarely one on second internode as well, curved forwards and forming a double row on front of stem. Phylactocarp bearing a double row of long nematothecae, with many septa both in the nematothecae and in the main axis. Nematotheca with four apertures, one terminal, one subterminal, one on the end of a tubular process near base, and one on the side of this tubular process. Gonothecae absent except for one empty one; this is oval and with a terminal aperture.

Measurements (mm)

Holotype

SAM-H2861 SAM-H1972

Hydrocladium internode length . . .	0,51-0,74	0,80-0,96
Hydrotheca, depth, abcauline base to tip of median tooth . . .	0,18-0,35	0,29-0,58
depth, horn to adcauline edge . . .	0,34-0,52	0,43-0,75
diameter at margin . . .	0,17-0,21	0,23-0,29

Variation and remarks

In this species the degree of curvature of the hydrotheca and the length of the horn vary markedly from stem to stem, and to a certain degree within the same stem. In SAM-H1972 the horn may vary from hardly recognizable (as in *C. inflatus* Vervoort) to about twice the width of the base, and is usually directed obliquely downwards. In the holotype the horn is in general longer and the hydrotheca more curved, so that in extreme cases the horn points obliquely upwards parallel with the axis of the distal half of the hydrotheca and reaching well beyond the distal end of the internode. The extreme variations in the two samples are illustrated in Figure 10.

Other variations include one branching hydrocladium which has developed as a stem, a branching nematotheca on the phylactocarp (Fig. 10C), and the presence of minute teeth round the edge of the hydropore in some hydrothecae. The internodal septa may be as many as 20 in the second sample.

In the curvature of the hydrotheca and the development of the horn this species is intermediate between *C. unicornus* Millard, where the internode and its septa are not involved in the curvature, and *C. dofleini* (Stechow), where the curvature is extreme and practically all the septa are involved. *C. natalensis* also differs from *C. dofleini* in the greater number of internodal septa, in the shorter distal part of the internode and in the longer and septate nematothecae on the phylactocarp.

Cladocarpus sinuosus Vervoort, 1966

Fig. 9A-C

Cladocarpus sinuosus Vervoort, 1966: 155, figs 55-57. Millard, 1975: 428, fig. 132E-H.

Description

These colonies provide further information on the variability of this interesting species.

One colony (Station SM 86) consists of about fifty stems reaching a maximum height of 38 mm. The hydrocladia have thick perisarc with up to ten inter-nodal septa and the hydrothecae are more strongly bent than in previous descriptions. In some of the hydrothecae an abcauline intrathecal septum occurs at a slightly lower level than the adcauline one, reminiscent of *C. leloupi* Millard; hydrothecae both with and without the abcauline septum may occur on the same stem.

Phylactocarps occur in this sample, bearing many oval gonothecae on their inner surfaces between the origins of the nematothecae. The gonothecae have broad subterminal apertures.

Another colony (Station SM 103) consists of a single infertile stem of 10 mm with only a few hydrocladia remaining. It clearly belongs to Vervoort's var. *edentatus*, although a very short abcauline marginal tooth does occur in some of the distal hydrothecae. An interesting feature of this colony is the presence of a short longitudinal septum against the concavity of the abcauline thecal wall of some hydrothecae, reminiscent of *C. paries* Millard.

DISCUSSION

It is not intended to discuss the geographic distribution of the species from this area in any detail at present, since a forthcoming paper will deal with the distribution of the whole of the southern African hydroid fauna utilizing many more records. It may, however, be mentioned in passing that the deep-water hydroids from off the Natal coast appear to be of an extremely mixed nature, including endemic, cosmopolitan, tropical and temperate species with no particular bias to any one component and no clear pointers to the origin of the fauna.

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